Commercial Demonstration of the NOXSO SO₂/NO_x Removal Flue Gas Cleanup System

Participant

NOXSO Corporation

Additional Team Members

Olin Corporation—cofunder
Gas Research Institute—cofunder
Electric Power Research Institute—cofunder
W.R. Grace and Company—cofunder
M.K. Ferguson—engineer
Richmond Power & Light (RP&L)—host

Location

To be determined

Technology

NOXSO Corporation's dry, regenerable flue gas cleanup process

Plant Capacity/Production

To be determined

Coal

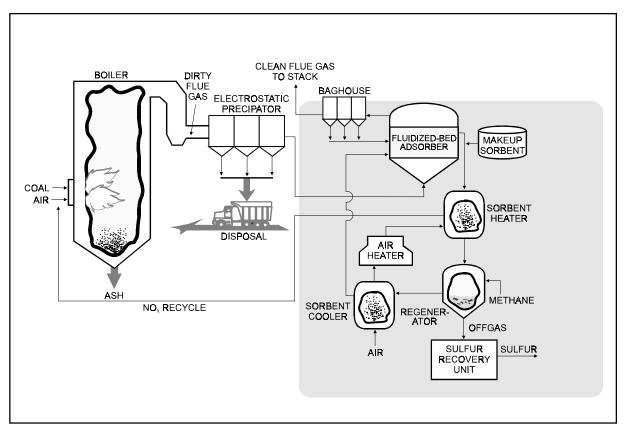
Medium- to high-sulfur coals

Project Funding

Total project cost	\$82,812,120	100%
DOE	41,406,060	50
Participant	41,406,060	50

Project Objective

To demonstrate removal of 98% of the SO_2 and 75% of the NO_x from a coal-fired boiler's flue gas using the NOXSO process.



Technology/Project Description

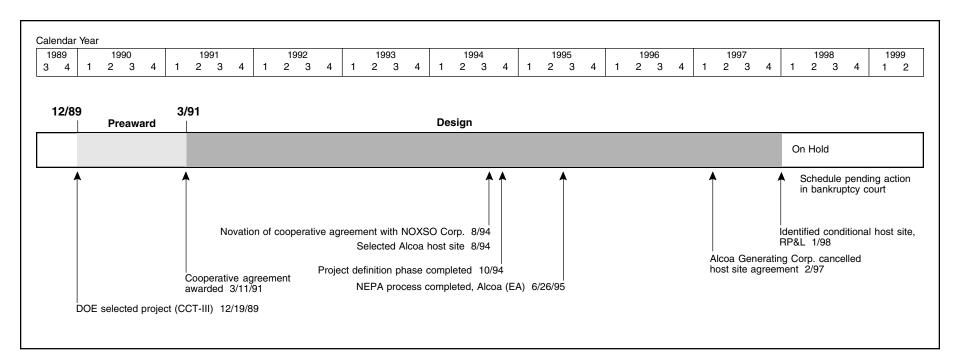
The NOXSO process is a dry, regenerable system capable of removing both SO_2 and NO_x in flue gas from coal-fired utility boilers burning medium- to high-sulfur coals. In the basic process, the flue gas passes through a fluidized-bed adsorber located downstream of the precipitator; SO_2 and NO_x are adsorbed by the sorbent, which consists of spherical beads of high-surface-area alumina impregnated with sodium carbonate. Cleaned flue gas then passes through a baghouse to the stack.

The $\mathrm{NO_x}$ is desorbed from the NOXSO sorbent when heated by a stream of hot air. Hot air containing the desorbed $\mathrm{NO_x}$ is recycled to the boiler where equilibrium processes cause destruction of the $\mathrm{NO_x}$. The adsorbed sulfur is recovered from the sorbent in a regenerator where it reacts with methane at high temperature to pro-

duce an offgas with high concentrations of SO_2 and hydrogen sulfide (H_2S). This offgas is processed to produce elemental sulfur, which can be further processed to produce liquid SO_2 , a higher valued by-product.

The process is expected to achieve SO₂ reductions of 98% and NO₂ reductions of 75%.

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Project Status/Accomplishments

Alcoa Generating Corporation chose to cancel a host site agreement when NOXSO was unable to obtain full project financing by January 31, 1997, as specified in the agreement. NOXSO signed a conditional Host Site Agreement with RP&L in January 1998.

NOXSO filed for bankruptcy under Chapter 11 - Reorganization. The Chapter 11 plan was approved by the Bankruptcy Court on September 2, 1998, but NOXSO was unable to raise sufficient funds. NOXSO closed its office in October 1998. By order of the bankruptcy court, NOXSO's second amended plan of reorganization under Chapter 11 was approved on December 9, 1999. One of the provisions of the approved plan was the rejection of the cooperative agreement; as a result, the cooperative agreement was terminated. Prior to publication of this report, the project ended in December 1999 in accordance with the order of the Bankruptcy Court.

Commercial Applications

The NOXSO process is applicable to existing or new facilities. The process is suitable for utility and industrial coal-fired boilers. The process is adaptable to coals with medium- to high-sulfur content.

The process produces one of the following as a salable by-products: elemental sulfur, sulfuric acid, or liquid SO₂. A readily available market exists for these products.

The technology is expected to be especially attractive to utilities that require high removal efficiencies for both ${\rm SO_2}$ and ${\rm NO_x}$, need to eliminate solid wastes, and/or have inadequate water supply for a wet scrubber.

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